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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,223	12/07/2001	Jong-Chull Shon	1594.1013	5569

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EXAMINER

HE, AMY

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 02/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/005,223

Applicant(s)

SHON ET AL.

Examiner

Amy He

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on December 07, 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Specification***

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

1. The abstract is objected to because it contains informal legal phrase "comprises" (on line 2). Correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1-29, the phrase "polymer-type" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by

disclosed (those encompassed by "polymer-type"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(b).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 15 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Wakabayashi et al. (U. S. Patent No. 3, 848, 218).

Referring to claims 1 and 15, Wakabayashi discloses a polymer-type humidity sensor (10 in Figures 1-2) comprising:

a polymer structure (1 in Figures 1-2) of a predetermined shape, wherein said polymer structure comprises a natural rubber (column 2, lines 47-48) and carbon(column 3, lines 25-27) mixed in said rubber; and

a pair of electric terminals (3-4 or 5-6 in Figures 1-2) contacting said polymer structure (column 1, lines 48-54).

Referring to claim 2, Wakabayashi discloses the polymer-type humidity sensor of claims 1, wherein the carbon added to said polymer structure is in a range of 15-20% plus and minus 5% volume (see column 6, table 1).

Referring to claim 3, Wakabayashi discloses the polymer-type humidity sensor of claims 1, wherein the polymer-type humidity sensor has a resistance in a range of 500 K-2M ohms (see column 6, table 1).

Referring to claim 4, Wakabayashi discloses the polymer-type humidity sensor of claims 1, wherein the polymer-type humidity sensor has an impedance of  $2 \times 10^6$  ohms and  $5 \times 10^5$  ohms (see column 6, table 1) at a relative humidity range of 0% and 100% and undergoes impedance change as a function of relative humidity over the whole relative humidity range (column 2, lines 18-28).

Referring to claim 26, Wakabayashi discloses a polymer-type humidity sensor (10 in Figures 1-2) comprising:

a polymer structure (1 in Figures 1-2) having opposing ends, wherein said polymer structure comprises a rubber (column 2, lines 47-48) and carbon (column 3, lines 25-27); and

electric terminals (3-4 or 5-6 in Figures 1-2), each contacting a corresponding one of the opposing ends of said polymer structure (column 1, lines 48-54).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 5-14 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakabayashi et al. (U. S. Patent No. 3, 848, 218), in view of Nishida (U. S. Patent No. 6, 429, 265).

Referring to claims 5 and 16, Wakabayashi discloses the polymer-type humidity sensor of claim 1, wherein a natural rubber (column 2, lines 47-48) is used to make the polymer structure. Wakabayashi does not specifically disclose NBR-Acrylic-Nitric Butadiene as the rubber used. Nishida discloses the claimed NBR-Acrylic-Nitric Butadiene rubber (column 7, line 37). A person of ordinary skill in the art at the time the invention was made would find it obvious to modify Wakabayashi to use NBR-Acrylic-Nitric Butadiene rubber, or any other type of polymer of synthetic rubber, as taught by Nishida, in order to reduce time by using materials of high moisture-absorbing and desorbing properties (column 2, lines 16-18).

Referring to claims 6-8 and 17-19, Wakabayashi further discloses the claimed amount of carbon range, resistance range and impedance range (column 6, table 1).

Referring to claim 9, Wakabayashi further discloses that the electric terminals (3-4 in Figures 1-2) are situated within said polymer structure at predetermined locations and extend outward from said polymer structure (see Figures 1-2).

Referring to claim 10, Wakabayashi further discloses that the electric terminals (5-6 in Figures 1-2) are situated externally and contact outer portions of said polymer structure (through 3 and 4 in Figures 1-2).

Referring to claim 11, Wakabayashi further discloses that the predetermined shape includes a planar surface (see the planar surface of 1 in Figures 1-2) to contact a gas having humidity.

Referring to claim 12-14, Wakabayashi discloses that the predetermined shape includes a planar surface (see the planar surface of 1 in Figures 1-2). Wakabayashi does not disclose a rounded surface, a cylindrical shape or a coil shape. It would have been obvious to a person of ordinary skill in the art at the time of the invention to further modify Wakabayashi to include a rounded surface shape, a cylindrical shape, a coil shape, or any other suitable shape as desired, depending on the situation and the shape of contacting surface, in order to increase the stability of the humidity sensor in an environment under test.

5. Claims 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (U. S. Patent No. 5, 847, 261), in view of Wakabayashi et al. (U. S. Patent No. 3, 848, 218).

Referring to claim 20, Lee discloses a microwave oven (10 in Figure 1) to cook food comprising:

- a body including a cooking cavity (300);
- a heating element (100 and 200) to cook the food in the cooking cavity(300);
- an air outlet unit (311, 321 and 331) to discharge air from the cooking cavity;
- a control unit (800) which controls the cooking of the food; and

a polymer-type humidity sensor (800) disposed at said air outlet to obtain information on a humidity content of the discharged air for use by said control unit, wherein said polymer-type humidity sensor comprises

a pair of electric terminals contacting the polymer structure.

Lee does not disclose a polymer structure having a natural rubber and carbon. Lee discloses a ceramic material (column 1, lines 47-48) instead.

Wakabayashi discloses the polymer structure having natural rubber and carbon.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lee to replace the vapor sensor (800) with the humidity sensor using polymer structure comprising natural rubber and carbon, as taught by Wakabayashi, in order to ensure operation of the humidity sensor at high humidity level. Since the ceramic sensing element in Lee does not have sufficiently high stability at high humidity (Wakabayashi reference, column 1, lines 9-14).

Referring to claim 21, Lee further discloses a cooling fan (400 in Figure 1), which draws atmospheric air into the cooking cavity while cooling said heating element.

Referring to claims 22-24, Wakabayashi further discloses the claimed amount of carbon range, resistance range and impedance range (see column 6, table 1).

6. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (U. S. Patent No. 5, 847, 261) in view of Wakabayashi et al. (U. S. Patent No. 3, 848, 218), as applied to claims 20-24 above, and further in view of Nishida (U. S. Patent No. 6, 429, 265).



Referring to claim 25, Lee in view of Wakabayashi discloses the microwave oven of claim 24, wherein nature rubber is used for the humidity sensor. Lee in view of Wakabayashi does not specifically disclose NBR-Acrylic-Nitrile Butadiene as the rubber used. Nishida discloses the claimed NBR-Acrylic-Nitrile Butadiene rubber (column 7, line 37). A person of ordinary skill in the art at the time the invention was made would find it obvious to further modify Lee to use NBR-Acrylic-Nitrile Butadiene rubber, or any other polymer of synthetic rubber, as taught by Nishida, in order to reduce time by using materials of high moisture-absorbing and desorbing properties (column 2, lines 16-18).

7. Claim 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakabayashi et al. (U. S. Patent No. 3, 848, 218).

Referring to claims 27-29, Wakabayashi discloses a planar polymer structure (1 in Figure 1-2). Wakabayashi does not disclose a cylindrical or a prismatic shape. It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Wakabayashi to include a cylindrical shape or a prismatic shape with rectangular cross-section, or any other suitable shape as desired, depending upon the situation and the shape of contacting surface, in order to increase the stability of the humidity sensor in an environment under test.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,661,405--discloses an elongate sensor for sensing an electrically conductive liquid, having electrodes made from a carbon-filled, silicone rubber material.

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U.S. patent 6,430,379--discloses NBR rubber dispersed in carbon and a humidity sensor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy He whose telephone number is (703) 305-3360.

The examiner can normally be reached on 8:30am-5pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, N. Le can be reached on (703) 308-0750.

The official Fax numbers for the organization are (703-872-9318) Before-Final and (703-872-9319) After-Final Office actions. Any inquiry of a general nature relating to this application should be directed to the receptionist at (703) 305-4900.

*ay*  
AH

February 20, 2003

*Christine Oda*  
**Christine Oda**  
**Primary Examiner**